

# United States Patent [19]

## Frenkel et al.

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## [54] WATCH WITH TIME INFORMATION VIA SILENT VIBRATION

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### [56] References Cited

## U.S. PATENT DOCUMENTS

### FOREIGN PATENT DOCUMENTS

0198576	10/1986	European Pat. Off
0349230	1/1990	European Pat. Off
7435930	10/1974	Germany .
2714585	3/1978	Germany .
8700364	1/1987	Germany .
3803387	8/1989	Germany .
61-28957	2/1986	Japan .
618827	8/1980	Switzerland .

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### [57] **ABSTRACT**

An electronic timepiece having an analog or digital display delivering time information in silent, tactile manner in which the control elements (L, C, B<sub>1</sub>, B<sub>2</sub>) provided on the exterior of a closed housing cooperate via the intermediary of an interpretation circuit with the electronic coding means (22) to drive the vibration generating device (23) by means of pulse strings to emit vibration strings representative of an item of time information or of the accuracy of a time instruction or non-time instruction introduced by means of said control elements.

The timepiece presents a conventional appearance, but enables a visually impaired person to know the time, to correct the internal time and to set an alarm time.

## 17 Claims, 5 Drawing Sheets

